Trend Study 15-14-04

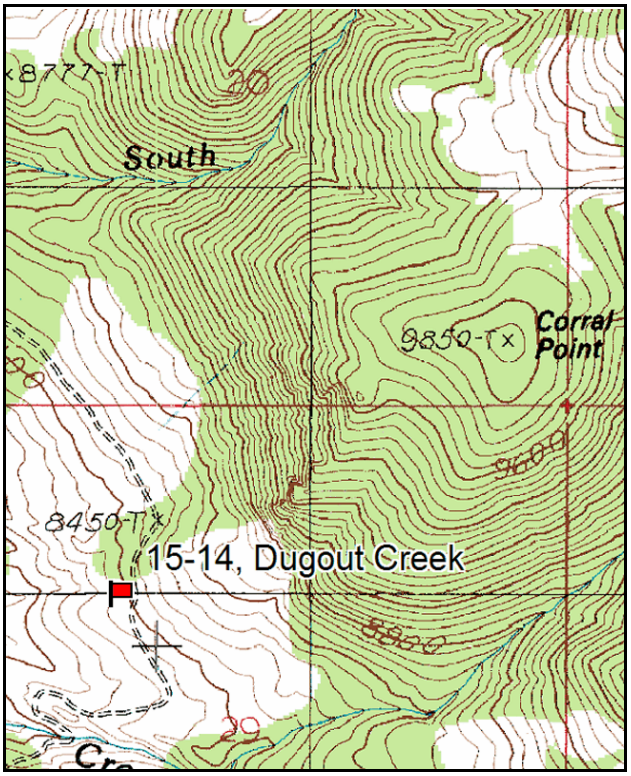
Study site name: Dugout Creek . Vegetation type: Mountain Big Sagebrush .

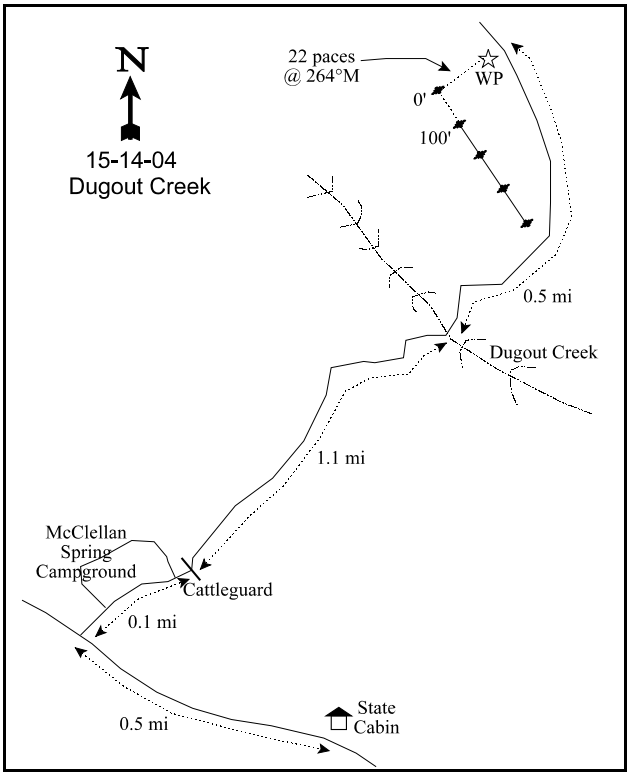
Compass bearing: frequency baseline 140°M-lines 1-2; 145°M-line 3; 140°M-line 4.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the DWR State Cabin travel north-west toward McClellan Spring for 0.5 miles. Turn right onto the road passing McClellan Spring Campground. Travel 0.1 miles to a cattleguard. Cross the cattleguard and continue 1.1 miles to Dugout Creek. Continue 0.5 miles past the creek to a witness post on the left hand side of the road. The beginning of the baseline is 22 paces from the witness post at 264°M. The 0-foot stake is marked with browse tag #153.





Map Name: Mount Ellen

Township 31S , Range 10E , Section 29

Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4214962 N, 514504 E

DISCUSSION

Dugout Creek - Trend Study No. 15-14

The Dugout Creek study is a replacement study for Dugout (15-3) which was in an area too small to lengthen the transect the larger sampling size adopted in 1992. This new site is just a short distance from the old one. It is located on a sagebrush flat that is surrounded by scattered pinyon, juniper, and oak brush. The site is dominated by mountain big sagebrush and secondarily by black sagebrush. The site is considered a key wintering area for deer. The site is located on a southeast aspect at an elevation of 8,360 feet with a variable slope of 10-15%. Water is available for livestock and wildlife within one-quarter mile of the study site. The site lies within the Nasty Flat Cattle Allotment. Pellet group data from 2004 indicates light use by cattle and bison with 3 cow days use/acre (7 cdu/ha) and 9 bison days use/acre (21 bdu/ha). Deer use was moderate at 41 deer days use/acre (102 ddu/ha).

The soils appear to be fairly deep with an estimated average effective rooting depth of almost 11 inches, although the measurements were quite variable as indicated by the abundance of both mountain big sagebrush (deeper soils) and black sagebrush (more shallow soils). There is a somewhat restrictive clay layer from 6 to 10 inches in depth, but it is quite variable, creating the distributional mosaic of mountain big sagebrush and black sagebrush. Rocks are prevalent on the soil surface (almost 15%) and throughout the upper portion of the soil profile. The soil is brown, clay loam with a neutral pH (7.3). Erosion was rated as stable in 2004. Vegetative and litter cover appears to be adequate to keep erosion at minimal levels. Some of the steeper slopes surrounding the site show more erosion.

Mountain big sagebrush and black sagebrush are the key browse species in the area. Mountain big sagebrush is the most abundant browse on the site with an estimated density of 3,340 plants/acre and 15% cover which is 47% of the total browse cover. There were no plants classified as young, but there were just over 10,000 seedlings/acre. Percent decadence is slightly above what one would normally expect at 31%. Forty-four percent of the plants were classified with moderate use. Black sagebrush was second in abundance in 2004 with an estimated density of 2,880 plants/acre and 7% cover. Recruitment was fair at 8% of the population classified as young. Percent decadence is moderate at 36%. Only 8% of the plants were determined to have moderate use. The moderately high percent decadence with the sagebrush has been common throughout the state due to drought. At this higher elevation it is not as pronounced as at the lower elevations.

Other preferred browse sampled were serviceberry and Gambel oak. Serviceberry is an important species, but is not very abundant (60 plants/acre) so it is not considered a key species here. Gambel oak shows little to no use. Pinyon pine, juniper, Rocky Mountain juniper, and limber pine are present but in low numbers. All four species combined only contribute to 6% total cover.

Grasses and forbs are diverse on the site, but none are particularly abundant. Eight grass and twenty forb species were sampled, totaling 34% of the total vegetative cover. Nearly 60% of the herbaceous understory is made up of cheatgrass (10% cover). Cheatgrass is found in association with mountain big sagebrush on this site. Soils must be different where black sagebrush occurs as no cheatgrass was found there. Slender wheatgrass, mutton bluegrass and bottlebrush squirreltail are the most abundant perennial grasses on the site. All occur at nearly the same quadrat frequency. These three species contribute to 91% of the perennial grass component. cheatgrass is a problem as it contributes to 59% of the total herbaceous cover.

APPARENT TREND ASSESSMENT

In 2004, litter cover (47%) and vegetative cover (49%) contribute substantially to total ground cover (96%). This would indicate that the site is well buffered from the erosive forces of wind and water. The browse trend would be considered stable to slightly down, depending on what proportion of the mountain big sagebrush

seedlings become established, because there is no young age class within the population at this time. At this time, mountain big sagebrush contributes to 47% of the total browse cover. The herbaceous understory trend would be thought of as slightly downward because of the large amount of cheatgrass throughout the understory. Currently, it makes up almost 60% of the herbaceous cover. Winter range condition (DC index) is 42, which is poor for a mountain big sagebrush community. It received a fairly low value because of the moderately high decadence for the preferred browse species and the high amount of cheatgrass on the site.

winter range condition (DC Index) - 42 (poor) Mountain big sagebrush type

HERBACEOUS TRENDS --
Management unit 15 , Study no: 14

Type	Species	Nested Frequency '04	Average Cover % '04
G	Agropyron trachycaulum	48	1.36
G	Bromus tectorum (a)	271	9.84
G	Oryzopsis hymenoides	1	.00
G	Poa fendleriana	45	1.32
G	Poa pratensis	2	.03
G	Poa secunda	3	.03
G	Sitanion hystrix	53	.85
G	Stipa lettermani	19	.30
Total for Annual Grasses		271	9.84
Total for Perennial Grasses		171	3.90
Total for Grasses		442	13.75
F	Agoseris glauca	12	.04
F	Antennaria rosea	4	.18
F	Arabis spp.	1	.00
F	Aster spp.	6	.03
F	Castilleja linariaefolia	7	.07
F	Calochortus nuttallii	10	.03
F	Cirsium spp.	1	.03
F	Crepis acuminata	48	.58
F	Cymopterus spp.	12	.04
F	Erigeron eatonii	38	.68
F	Gayophytum ramosissimum(a)	8	.06
F	Ipomopsis aggregata	4	.04
F	Lappula occidentalis (a)	39	.22
F	Lomatium spp.	5	.03
F	Machaeranthera canescens	4	.01
F	Phlox longifolia	21	.13

Type	Species	Nested Frequency '04	Average Cover % '04
F	Polygonum douglasii (a)	66	.20
F	Senecio multilobatus	1	.00
F	Taraxacum officinale	8	.31
F	Tragopogon dubius	5	.06
Total for Annual Forbs		113	0.49
Total for Perennial Forbs		187	2.32
Total for Forbs		300	2.81

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 15 , Study no: 14

Type	Species	Strip Frequency '04	Average Cover % '04
B	Amelanchier utahensis	3	.03
B	Artemisia nova	37	7.15
B	Artemisia tridentata vaseyana	56	14.93
B	Chrysothamnus depressus	1	-
B	Chrysothamnus nauseosus graveolens	8	1.01
B	Gutierrezia sarothrae	25	1.14
B	Juniperus osteosperma	1	.85
B	Juniperus scopulorum	0	3.77
B	Opuntia spp.	1	-
B	Pinus edulis	1	1.00
B	Pinus flexilis	1	.85
B	Quercus gambelii	4	.76
Total for Browse		138	31.52

CANOPY COVER, LINE INTERCEPT --
Management unit 15 , Study no: 14

Species	Percent Cover '04
Amelanchier utahensis	.36
Artemisia nova	5.98
Artemisia tridentata vaseyana	15.30
Chrysothamnus nauseosus graveolens	1.11
Gutierrezia sarothrae	.51
Juniperus osteosperma	1.08
Juniperus scopulorum	4.59
Pinus edulis	1.60
Pinus flexilis	1.26
Quercus gambelii	.90

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 15 , Study no: 14

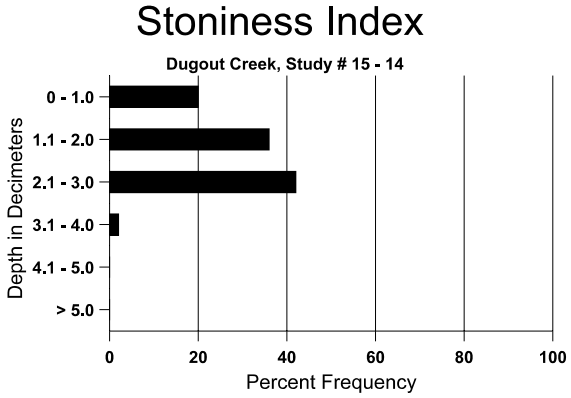
Species	Average leader growth (in) '04
Artemisia tridentata vaseyana	1.4

BASIC COVER --
Management unit 15 , Study no: 14

Cover Type	Average Cover % '04
Vegetation	48.49
Rock	11.46
Pavement	3.27
Litter	46.51
Cryptogams	.03
Bare Ground	12.10

SOIL ANALYSIS DATA --
Management unit 15, Study no: 14, Study Name: Dugout Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
10.5	58.4 (11.8)	7.2	28.3	32.2	39.5	2.1	14.0	361.6	0.5



PELLET GROUP DATA --
Management unit 15 , Study no: 14

Type	Quadrat Frequency '04	Days use per acre (ha) '04
Rabbit	11	-
Deer	8	42 (103)
Cattle	-	3 (7)
Buffalo	7	9 (22)

BROWSE CHARACTERISTICS --
Management unit 15 , Study no: 14

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
04	**60**	-	-	60	-	-	67	0	-	-	0	29/35
Artemisia nova												
04	**2880**	460	240	1600	1040	460	8	0	36	9	9	12/24
Artemisia tridentata vaseyana												
04	**3340**	10080	-	2300	1040	960	44	0	31	13	13	26/35
Cercocarpus montanus												
04	**0**	-	-	-	-	-	0	0	-	-	0	36/45
Chrysothamnus depressus												
04	**20**	-	-	20	-	-	0	0	-	-	0	6/10
Chrysothamnus nauseosus graveolens												
04	**260**	20	-	140	120	-	0	0	46	8	15	34/39

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae												
04	**1180**	60	180	980	20	-	8	0	2	-	0	7/9
Juniperus osteosperma												
04	**20**	-	-	20	-	-	0	0	-	-	0	-/-
Opuntia spp.												
04	**20**	-	20	-	-	-	0	0	-	-	0	4/18
Pinus edulis												
04	**20**	60	20	-	-	-	0	0	-	-	0	-/-
Pinus flexilis												
04	**20**	-	-	20	-	-	0	0	-	-	0	-/-
Quercus gambelii												
04	**420**	-	80	340	-	120	0	0	-	-	0	45/22
Ribes spp.												
04	**0**	-	-	-	-	-	0	0	-	-	0	61/56
Symphoricarpos oreophilus												
04	**0**	-	-	-	-	-	0	0	-	-	0	20/44